

REMARKS

Claims 1-70 remain in this application, with Claims 22-24, 28-37, 42-47 and 65-70 withdrawn from consideration by the Examiner and Claims 1 and 20 amended. By these amendments, no new matter has been added.

The Examiner rejected Claims 1-21, 25-27, 38-41, and 48-64 under 35 U.S.C. § 112, second paragraph, as being indefinite. These rejections are respectfully traversed.

In particular, the Examiner stated that lines 8 and 12-13 of Claim 1 were unclear. The Applicants thank the Examiner for providing the diagram in Attachment 1 of the Office Action to clarify the basis for the Examiner's rejection. Accordingly, Claim 1 has been amended a second time to address the aspects that the Examiner believed were unclear while still essentially defining a beam that is contoured across its width as shown, for example, in Figs. 1A, 5A, 5B and 6. Clearly, what was formerly called the first and second edges of the beam, and is now called the opposite ends of the cross-section, refers only to the outermost ends identified by the Examiner as "e<sub>1</sub>''" and "e<sub>2</sub>'". It follows that the distance between the opposite ends of the cross-section is that identified by "d<sub>3</sub>," and not "d<sub>1</sub>" or "d<sub>2</sub>." Applicants submit that the points identified on Attachment 1 as "e<sub>1</sub>'", "e<sub>2</sub>'", "e<sub>1</sub>''", and "e<sub>2</sub>''" are neither edges nor ends, nor are they located on edges or ends of the cross-section. Claim 1 as amended is therefore believed to be sufficiently definite, and Claim 20 has been amended for consistency with Claim 1. These rejections should therefore be withdrawn.

The Examiner rejected Claims 1-2, 9, 13, 18-20, 25, 38-41, 48 and 56-59 under 35 U.S.C. 102(b) as being anticipated by Grabbe. This rejection is respectfully traversed. The Examiner acknowledges that Grabbe discloses a sheet metal spring contact having a flat beam in widthwise cross-sections. Therefore, the basis for these rejections, as shown by the Examiner's helpful notes in Attachment 2 of the Office Action, was that the Examiner believed that a flat beam reads on the limitations as formerly set forth in Claim 1.

Accordingly, Claim 1 has been amended to more clearly distinguish over Grabbe.

Grabbe fails to disclose or suggest a beam of elongated sheet material with cross-sections having "a portion of said sheet disposed a perpendicular distance from a neutral axis of said every cross-section substantially greater than one-half of said uniform thickness of said sheet," as defined by Claim 1. That is, to the extent that the distance "d" identified on Attachment 2 is greater than one-half of the sheet (beam) thickness, it is not a perpendicular distance from the neutral axis (see Attachment 2 to this Amendment). Failing to disclose every element of Claim 1, Grabbe accordingly does not anticipate Claim 1 or any of its dependent Claims 2, 9, 13, 18-20, 25, 38-41, 48 and 56-59. These rejections should therefore be withdrawn.

The Examiner rejected Claims 3-8, 10-12, 14-17, 22-24, 26-37, 42-47, 49-55, 60-64 under 35 U.S.C. § 103(a) as being unpatentable over Grabbe. These rejections are respectfully traversed. Grabbe fails to disclose or suggest a beam of sheet material with cross-sections having "a portion of said sheet disposed a perpendicular distance from a neutral axis of said every cross-section substantially greater than one-half of said uniform thickness of said sheet," as defined by Claim 1. Nor would it have been obvious to shape a contact beam in the defined manner. The present case may easily be distinguished from the prior cases, In re Dailey and In re Leshin, cited by the Examiner.

In re Dailey and Eilers, 149 USPQ 47 (C.C.P.A. 1966) involved a comparison of nursing bottle shapes. The Court merely held that "[a]ppellants have presented no argument which convinces us that the particular configuration of their container is significant or is anything more than one of numerous configurations a person of ordinary skill in the art would find obvious." Id. at 50. In so doing, it applied the well-known standard set forth by the Supreme Court in Graham v. John Deere Co., 383 U.S. 1, 148 U.S.P.Q. 459 (1966). In re Leshin, 125 U.S.P.Q. 416 (C.C.P.A. 1960) merely contains findings both for and against patentability of certain claims based on the record before the Court. It contains no relevant discussion of the standard for obviousness, and is now superceded by Graham v. John Deere. Neither case stands for the proposition that

shape limitations are *per se* obvious, as the Examiner seems to suggest. The Examiner has not presented any evidence to rebut Applicant's arguments explaining why the beam shape of the present invention is not obvious, and has not properly made out a *prima facie* case of obviousness with respect to the shape limitation.

A more recent example of the obviousness standard as applied to articles of different shape may be found in ATD Corporation v. Lydall, Inc., 159 F.3d 534, 48 U.S.P.Q. 2d 1321 (Fed. Cir. 1998). ATD involved a heat insulation shield for use in automobiles. The shield comprised stacked layers of metal foil. The layers were embossed to keep them separate and spaced apart from one another, but in certain areas, the foil layers were compressed together. *Id.* at 538-9. The prior art showed insulators made of stacked layers of embossed metal foil, but did not show insulators with areas of compressed foil. *Id.* at 545. The issue was whether articles that included compressed foil areas were obvious in view of prior-art articles that were otherwise the same, except for the absence of compressed areas. The Court overturned a jury verdict of invalidity and held the claims valid (not obvious). Applying the standard set forth in Graham v. John Deere, the Court reasoned that there was no substantial evidence of a "teaching or suggestion in the prior art or in the general knowledge of persons of ordinary skill in the field" to make the claimed combination of compressed and separated foil layers. *Id.* at 546.

Applying this standard to the case at hand, the Examiner has not provided any substantial evidence of a teaching or suggestion to combine a beam of contoured sheet material with a microelectronic spring contact of the type having "a beam formed integrally with said base of said resilient material by depositing said resilient material in a uniform layer over a substrate," as defined by Claim 1. Such spring contacts are amenable to being manufactured *en masse* at very fine pitches using deposition methods such as electroplating or even sputtering over lithographically patterned substrates. At the same time, such forming methods would have discouraged one of ordinary skill from forming a contoured beam, because contouring of patterned

substrates has heretofore been quite limited, or even non-existent. Grabbe also fails to disclose or suggest forming a spring contact in this manner.

Nor can these deficiencies of Grabbe be made up for using other references of record, such as Kinkaid or Seymour. None of the prior-art references that show a contoured beam portion concern microelectronic spring contacts of this type, and therefore, could not have provided a suggestion for contouring their beams. Instead, all of the references concern forms made by stamping sheet metal, a forming method in which contouring would have raised quite different considerations.

In summary, Grabbe fails to disclose or suggest a beam that is contoured in the manner defined by Claim 1. Grabbe also fails to disclose or suggest a spring contact formed in the manner defined by Claim 1. Claim 1 is neither anticipated by, nor obvious in view of Grabbe, and the rejection of Claim 1 should therefore be withdrawn. All of Claims 3-8, 10-12, 14-17, 22-24, 26-37, 42-47, 49-55, 60-64 depend from Claim 1. These rejections should therefore also be withdrawn.

The Examiner rejected Claim 21 under 35 U.S.C. § 103(a) as being unpatentable over Grabbe in view of Kinkaid. Kinkaid (Figs. 2, 4, and 6-9) shows a latching connector having an embossment 90. Kinkaid fails to disclose or suggest a specific cross-sectional shape for the embossment. In addition, it should not be overlooked that Kinkaid concerns a latching-type connector, and not a spring contact of the type disclosed in Grabbe. One of ordinary skill would not have been motivated to combine an embossment intended to stiffen a latch with a spring contact as disclosed by Grabbe, for which it is desired to "flatten the force deflection curve substantially." Grabbe, col. 3, ll. 36-37. One of ordinary skill would recognize that an embossment as disclosed by Kinkaid would tend to have the opposite effect, and would thereby be deprived of any motivation for the proposed combination.

Even if the proposed combination were to be made, the present invention would not result, because the spring contact would not be formed by depositing a resilient material over a substrate. Moreover, use of the defined forming method would have

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discouraged one of ordinary skill from contouring the beam across its width, as explained above. And as noted above, both Grabbe and Kinkaid fail to disclose or suggest making structural parts of spring contacts by depositing a resilient material over a substrate. For the foregoing reasons, Kinkaid does not make up for the deficiencies of Grabbe, and this rejection should therefore be withdrawn.

In view of the foregoing, the Applicants respectfully submit that Claims 1-70 are in condition for allowance. Entry of the amendments, and reconsideration and withdrawal of the rejections are respectfully requested, and a timely Notice of Allowability is solicited.

To the extent it would be helpful to placing this application in condition for allowance, the Applicants encourage the Examiner to contact the undersigned counsel and conduct a telephonic interview.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned **"Version with markings to show changes made."**

While the Applicant believes that no fees are due in connection with the filing of this paper, the Commissioner is authorized to charge any shortage in the fees, including extension of time fees, to Deposit Account No. 50-0639.

Respectfully submitted,

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Enclosures

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS:**

Claims 1 and 20 have been amended as follows:

1. (Twice Amended) A microelectronic spring structure, comprising:
  - a base formed of a resilient material;
  - a beam formed integrally with said base of said resilient material by depositing said resilient material in a uniform layer over a substrate, [and connected to said base at a first end of said beam] said beam comprising an elongated sheet of said resilient material cantilevered from said base along a path, said sheet having a substantially uniform thickness and upper and lower surfaces bounded by opposing edges, said opposing edges narrower than said upper and lower surfaces and defining widths of said beam perpendicular to said path; and
    - a tip positioned at a second end of said beam opposite to said base;
  - wherein said beam has an unsupported span between said tip and said base [and wherein said beam has a length running between said base and said tip, a substantially uniform thickness, and a width between a first edge and a second edge of said beam,] and [wherein] every cross-section [of said beam] taken across [said] a width of said unsupported span perpendicular to said path having opposite ends defined by said opposing edges has, for at least a [portion] length of said unsupported span, [extends] a portion of said sheet disposed a perpendicular distance from a neutral axis of said every cross-section [for a distance] substantially greater than one-half of [the] said substantially uniform thickness of said [beam] sheet, said neutral axis running through [said first edge, said second edge, and] a centroid of said every cross-section and disposed parallel to a line between said opposite ends of said every cross-section.

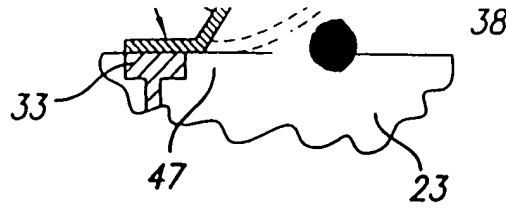
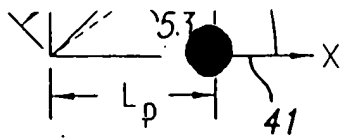
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20. (Twice Amended) The microelectronic spring structure of Claim 1, wherein said every cross-section [of said unsupported span taken across said width of said beam] at every location along said length of said [beam] unsupported span [extends] has a portion disposed a perpendicular distance from [a] said neutral [bending] axis of said every cross-section [for a distance] substantially greater than one-half of said substantially uniform thickness of said [beam] sheet.

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$e_1$  = first edge  
 $e_2$  = second edge  
 $d_i$  = distance between edges

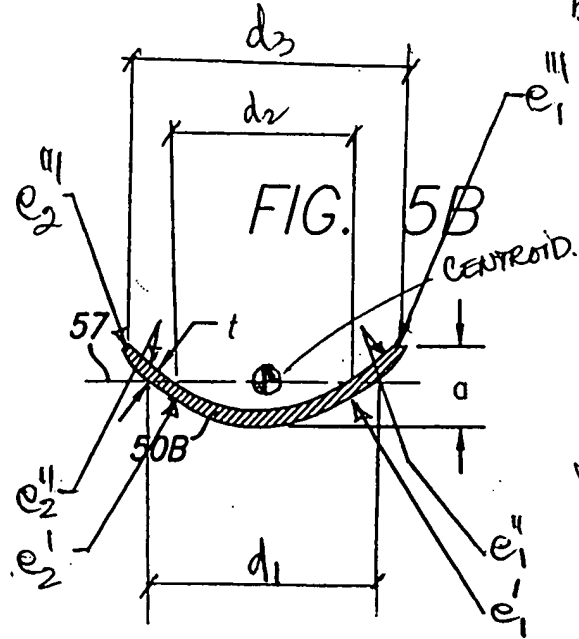
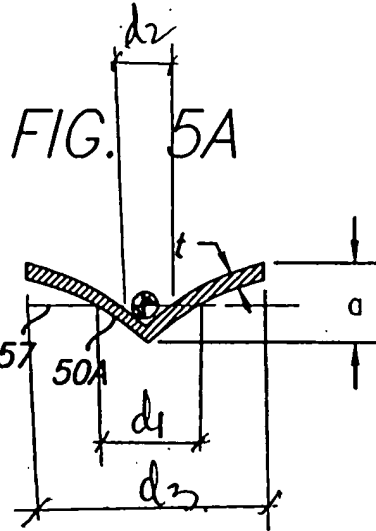


FIG. 5C

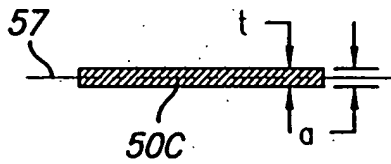
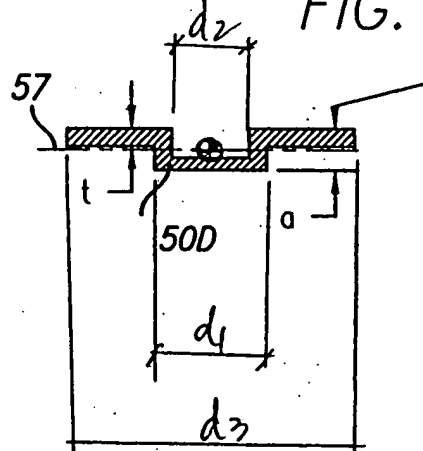


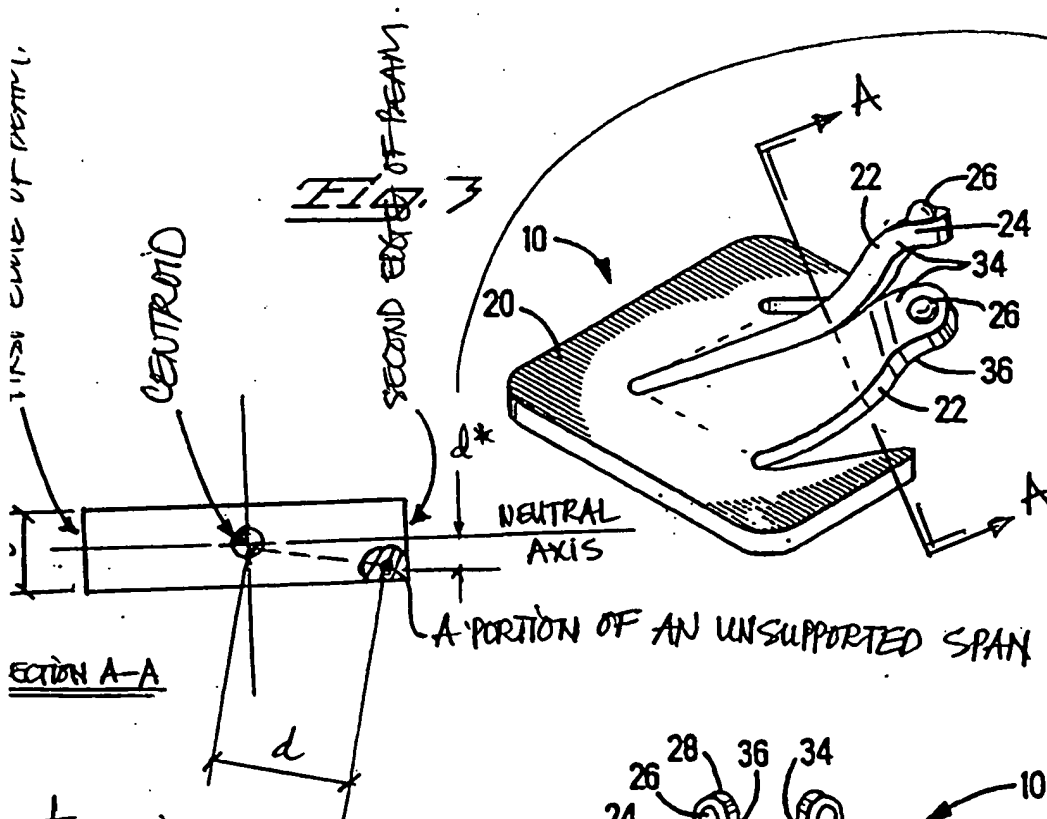
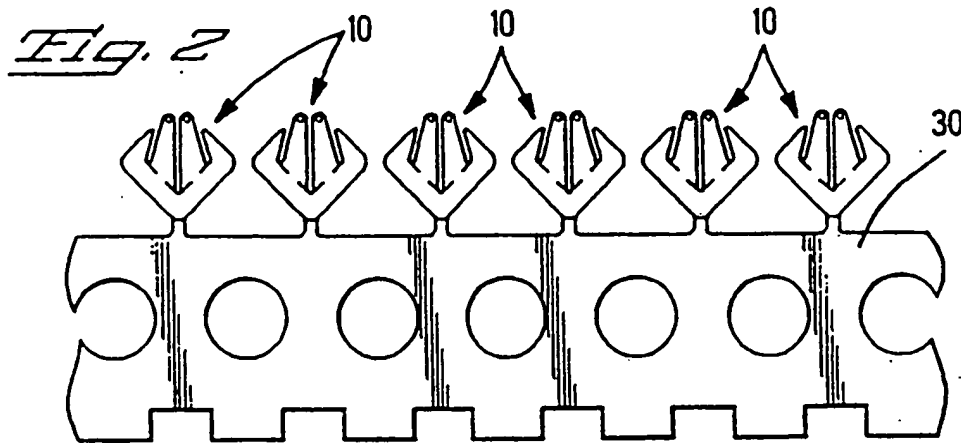
FIG. 5D



Opposing ends of the cross-section in Fig. 5B are  $e_1'''$  and  $e_2'''$ . Width of the cross-sections is  $d_3$ .

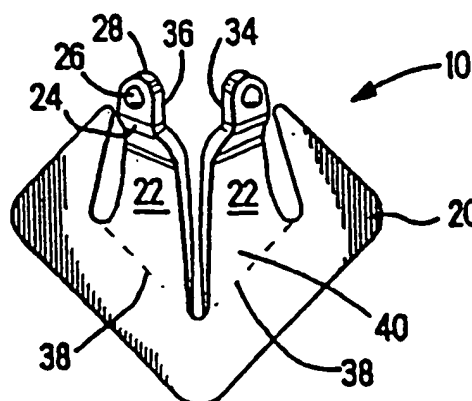
ATTACHMENT 1





SECTION A-A

A PORTION OF AN UNSUPPORTED SPAN



$t$  = UNIFORM THICKNESS.  
 $d$  = DISTANCE EXTENDS FROM A NEUTRAL AXIS @ CENTROID TO A PORTION OF AN UNSUPPORTED SPAN.

$$d > \frac{1}{2}t$$

ATTACHMENT 2